CLAIMS

1. A light-emitting device comprising:

at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device;

each of the first semiconductor element for switching and the second semiconductor element for driving element comprising:

a layer containing titanium or a titanium oxide formed over a substrate;

a gate electrode layer formed over the layer;

a gate insulating film formed over the gate electrode layer;

a semiconductor film formed over the gate insulating film;

a source electrode and a drain electrode formed over the semiconductor film; and

a second insulating film formed above a portion serving as a channel region in the semiconductor film;

wherein the source electrode or the drain electrode of the first semiconductor element for switching is connected to the gate electrode layer of the semiconductor element for driving.

2. A light-emitting device comprising:

at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device;

each of the first semiconductor element for switching and the second semiconductor element for driving comprising:

a layer containing titanium or a titanium oxide formed over a substrate;

a gate electrode layer formed over the layer;

a gate insulating film formed over the gate electrode layer;

a semiconductor film formed over the gate insulating film;

a source electrode and a drain electrode formed over the semiconductor film; and

a second insulating film formed above a portion serving as a channel region in the semiconductor film;

wherein a column-like conductor is formed above a portion of the gate electrode layer of the second semiconductor element for driving, and the source electrode or the drain electrode of the first semiconductor element for switching is connected to the column-like conductor via a wiring.

3. A light-emitting device according to Claim 1, wherein the second insulating film has a thickness of 100 nm or more.

4. A light-emitting device according to Claim 2, wherein the second insulating film has a thickness of 100 nm or more.

5. A light-emitting device according to Claim 1, wherein a thickness of a portion of the semiconductor film provided with the insulating film is thinner than that of another portion of the semiconductor film, and the thickness of the portion of the semiconductor film provided with the insulating film is 10 nm or more.

6. A light-emitting device according to Claim 2, wherein a thickness of a portion of the semiconductor film provided with the insulating film is thinner than that of another portion of the semiconductor film, and the thickness of the portion of the semiconductor film provided with the insulating film is 10 nm or more.

7. A light-emitting device according to Claim 1, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

8. A light-emitting device according to Claim 2, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

9. An electroluminescent television device having the light-emitting device according to any one of Claim 1.

10. An electroluminescent television device having the light-emitting device according to Claim 2.

11. An electroluminescent television device having the light-emitting device according to Claim 3.

12. An electroluminescent television device having the light-emitting device according to Claim 4.

13. An electroluminescent television device having the light-emitting device according to Claim 5.

14. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a first semiconductor film over the gate insulating film;

forming a second semiconductor film containing an impurity element having a conductivity type over the first semiconductor film;

forming a source electrode and a drain electrode by discharging a composite containing a second conductive material over the second semiconductor film;

forming a source region and a drain region by removing a part of the second semiconductor film using the source electrode and the drain electrode as a mask;

forming a second insulating film above a portion serving as a channel region in the semiconductor film;

forming an island-like semiconductor film by removing a part of the semiconductor film using the source electrode, the drain electrode, and the second insulating film as a mask;

wherein a contact hole is formed by removing at least a part of the gate insulating film over the gate electrode layer of the second semiconductor element for driving; and a wiring for connecting the source electrode or the drain electrode to the gate electrode layer of the second semiconductor element is formed by discharging a composite containing a third conductive material via the contact hole.

15. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a first semiconductor film over the gate insulating film;

forming a second semiconductor film containing an impurity element having a conductivity type over the first semiconductor film;

forming a source electrode and a drain electrode by discharging a composite

containing a second conductive material over the second semiconductor film;

forming a source region and a drain region by removing a part of the second semiconductor film using the source electrode and the drain electrode as a mask;

forming a second insulating film above a portion serving as a channel region in the first semiconductor film;

forming an island-like semiconductor film and an island-like gate insulating film by removing a part of the first semiconductor film and a part of the gate insulating film using the source electrode, the drain electrode, and the second insulating film as a mask;

wherein a contact hole is formed by removing at least a part of the second gate insulating film over the gate electrode layer of the second semiconductor element; and a wiring for connecting the source electrode or the drain electrode to the gate electrode layer of the second semiconductor element is formed by discharging a composite containing a third conductive material via the contact hole.

16. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a first semiconductor film over the gate insulating film;

forming a second semiconductor film containing an impurity element having a conductivity type over the first semiconductor film;

forming a source electrode and a drain electrode by discharging a composite containing a second conductive material over the second semiconductor film;

forming a source region and a drain region by removing a part of the second semiconductor film using the source electrode and the drain electrode as a mask;

forming an second insulating film above a portion serving as a channel region in the first semiconductor film;

forming an island-like semiconductor film by removing a part of the first semiconductor film using the source electrode, the drain electrode, and the second insulating film as a mask;

wherein a column-like conductor is formed by discharging a composite containing a conductive material which is the same or different from the first conductive material above a part of a gate electrode layer of the second semiconductor element before forming the gate insulating film; and a wiring for connecting the source electrode or the drain electrode to the column-like conductor is formed by discharging a composite containing a third conductive material.

17. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a first semiconductor film over the gate insulating film;

forming a second semiconductor film containing an impurity element having a conductivity type over the semiconductor film;

forming a source electrode and a drain electrode by discharging a composite containing a second conductive material over the second semiconductor film;

forming a source region and a drain region by removing a part of the second semiconductor film using the source electrode and the drain electrode as a mask;

forming a second insulating film above a portion serving as a channel region in the first semiconductor film;

forming an island-like semiconductor film and an island-like gate insulating

film by removing a part of the first semiconductor film and a part of the gate insulating film using the source electrode, the drain electrode, and the insulating film as a mask;

wherein a column-like conductor is formed by discharging a composite containing a conductive material which is the same or different from the first conductive material above a part of a gate electrode layer of the second semiconductor element before forming the gate insulating film; and a wiring for connecting the source electrode or the drain electrode to the column-like conductor is formed by discharging a composite containing a third conductive material.

18. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a first semiconductor film over the gate insulating film;

forming a second semiconductor film containing an impurity element having a conductivity type over the semiconductor film;

forming a source electrode and a drain electrode by discharging a composite containing a second conductive material over the second semiconductor film;

forming a source region and a drain region by removing a part of the second semiconductor film using the source electrode and the drain electrode as a mask;

forming a second insulating film above a portion serving as a channel region in the first semiconductor film;

forming an island-like semiconductor film by removing a part of the first semiconductor film using the source electrode, the drain electrode, and the second insulating film as a mask;

wherein a wiring is formed by discharging a composite containing a third

conductive material so as to be in contact with the source electrode or the drain electrode; a contact hole is formed by removing at least a part of the gate insulating film over a gate electrode layer of the second semiconductor element using the wiring as a mask; and a conductor for connecting the wiring to the gate electrode layer of the second semiconductor element by discharging a composite containing a fourth conductive material over the contact hole.

19. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a first semiconductor film over the gate insulating film;

forming a second semiconductor film containing an impurity element having a conductivity type over the semiconductor film;

forming a source electrode and a drain electrode by discharging a composite containing a second conductive material over the second semiconductor film;

forming a source region and a drain region by removing a part of the second semiconductor film using the source electrode and the drain electrode as a mask;

forming a second insulating film above a portion serving as a channel region in the first semiconductor film;

forming an island-like semiconductor film and an island-like gate insulating film by removing a part of the first semiconductor film and a part of the gate insulating film using the source electrode, the drain electrode, and the second insulating film as a mask;

wherein a wiring which is in contact with the source electrode or the drain electrode is formed by discharging a composite containing a third conductive material

so as to be in contact with the source electrode or the drain electrode; a contact hole is formed by removing at least a part of the gate insulating film over a gate electrode layer of the second semiconductor element using the wiring as a mask; and a conductor for connecting the wiring to the gate electrode layer of the second semiconductor element by discharging a composite containing a fourth conductive material over the contact hole.

20. A method for manufacturing a light-emitting device according to Claim 7, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

21. A method for manufacturing a light-emitting device according to Claim 8, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

22. A method for manufacturing a light-emitting device according to Claim 9, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

23. A method for manufacturing a light-emitting device according to Claim 10, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

24. A method for manufacturing a light-emitting device according to Claim 11, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

25. A method for manufacturing a light-emitting device according to Claim 12, wherein the second insulating film comprises a material selected from the group consisting of polyimide, acrylic, or a material which has a bond of silicon and oxygen, and which includes at least hydrogen as a substituent, or at least one selected from the group consisting of fluoride, alkyl group, and aromatic hydrocarbon as the substituent.

26. An electroluminescent television device having a light-emitting device manufactured by the method for manufacturing according to Claim 7.

27. An electroluminescent television device having a light-emitting device manufactured by the method for manufacturing according to Claim 8.

28. An electroluminescent television device having a light-emitting device manufactured by the method for manufacturing according to Claim 9.

29. An electroluminescent television device having a light-emitting device manufactured by the method for manufacturing according to Claim 10.

30. An electroluminescent television device having a light-emitting device manufactured by the method for manufacturing according to Claim 11.

31. An electroluminescent television device having a light-emitting device manufactured by the method for manufacturing according to Claim 12.

32. An electroluminescent television device having a light-emitting device manufactured by the method for manufacturing according to Claim 13.

33. A light-emitting device comprising:

at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device;

wherein the first semiconductor element for switching and the second semiconductor element for driving element comprising:.

a layer containing titanium or a titanium oxide formed over a substrate;

a gate electrode layer formed over the layer;

a gate insulating film formed over the gate electrode layer;

a semiconductor film formed over the gate insulating film;

a source electrode and a drain electrode formed over the semiconductor film; and

a second insulating film formed above a portion serving as a channel region in the semiconductor film.

34. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a semiconductor film over the gate insulating film;

forming a semiconductor film containing an impurity element having a conductivity type over the semiconductor film;

forming a source electrode and a drain electrode by discharging a composite containing a second conductive material over the semiconductor film containing a single conductivity impurity element;

forming a source region and a drain region by removing a part of the semiconductor film containing a single conductivity impurity element using the source electrode and the drain electrode as a mask;

forming a second insulating film above a portion serving as a channel region in the semiconductor film;

forming an island-like semiconductor film by removing a part of the semiconductor film using the source electrode, the drain electrode, and the second insulating film as a mask.

35. A method for manufacturing a light-emitting device having, at least a first semiconductor element for switching and a second semiconductor element for driving in one pixel of the light-emitting device, said method comprising the steps of:

for forming the first semiconductor element for switching and the second semiconductor element for driving,

forming a gate electrode layer by discharging a composite containing a first conductive material over a substrate;

forming a gate insulating film over the gate electrode layer;

forming a semiconductor film over the gate insulating film;

forming a semiconductor film containing an impurity element having a conductivity type over the semiconductor film;

forming a source electrode and a drain electrode by discharging a composite containing a second conductive material over the semiconductor film containing an impurity element having a conductivity type;

forming a source region and a drain region by removing a part of the semiconductor film containing an impurity element having a conductivity type using the source electrode and the drain electrode as a mask;

forming a second insulating film above a portion serving as a channel region in

the semiconductor film;

forming an island-like semiconductor film and an island-like gate insulating film by removing a part of the semiconductor film using the source electrode, the drain electrode, and the insulating film as a mask.